HENNEGUYA LAGODON, A NEW SPECIES OF MYXOSPORIDIAN, PARASITIZING THE PINFISH, *LAGODON RHOMBOIDES*[1]

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ABSTRACT

A new myxosporidian is described. It was found on the head of pinfish, *Lagodon rhomboides*, collected in marine waters at the southern tip of Florida. The name *Henneguya lagodon* is suggested.

A comprehensive paper by Caldwell (1957) has provided much information on the biology of the pinfish, *Lagodon rhomboides*. This species extends from Cape Cod, Massachusetts to Yucatan, Mexico, and occurs in Bermuda. The young are spawned offshore during fall and winter and move inshore. Pinfish apparently tolerate a wide range of salinity, occasionally entering fresh water. They have been known to reach over 200 mm in length.

Caldwell (1957) listed the parasites known to occur on pinfish, together with those he encountered during his study. He reports the presence of a myxosporidian on fish collected at Cedar Key, Florida, but did not provide a description of this parasite. Apparently this is the same species we describe here.

Personnel of the Institute of Marine Science were helpful in making this study possible. Mr. Martin Roessler located infected pinfish and provided data on incidence of infection. Mr. William M. Stephens made the photograph of the cysts.

Henneguya lagodon, sp. n.

Figs. 1, 2

Material.—The two infected fish used for study were 49 and 63 mm long. They were collected during May and June of 1964 in the Buttonwood Canal in Everglades National Park, Florida, in conjunction with a study of the pink shrimp, *Penaeus duorarum*, sponsored by the Bureau of Commercial Fisheries. The surface salinity of the canal ranges between about 30 and 70 parts per thousand annually.

The fish were killed and cleared in alcohol. Preservation causes shrinkage of some myxosporidian spores (Kudo, 1921); since we were unable to obtain fresh material for study it is possible that the spores we measured were somewhat smaller than live spores. The material is deposited in U. S. National Museum, Cat. No. 23757.

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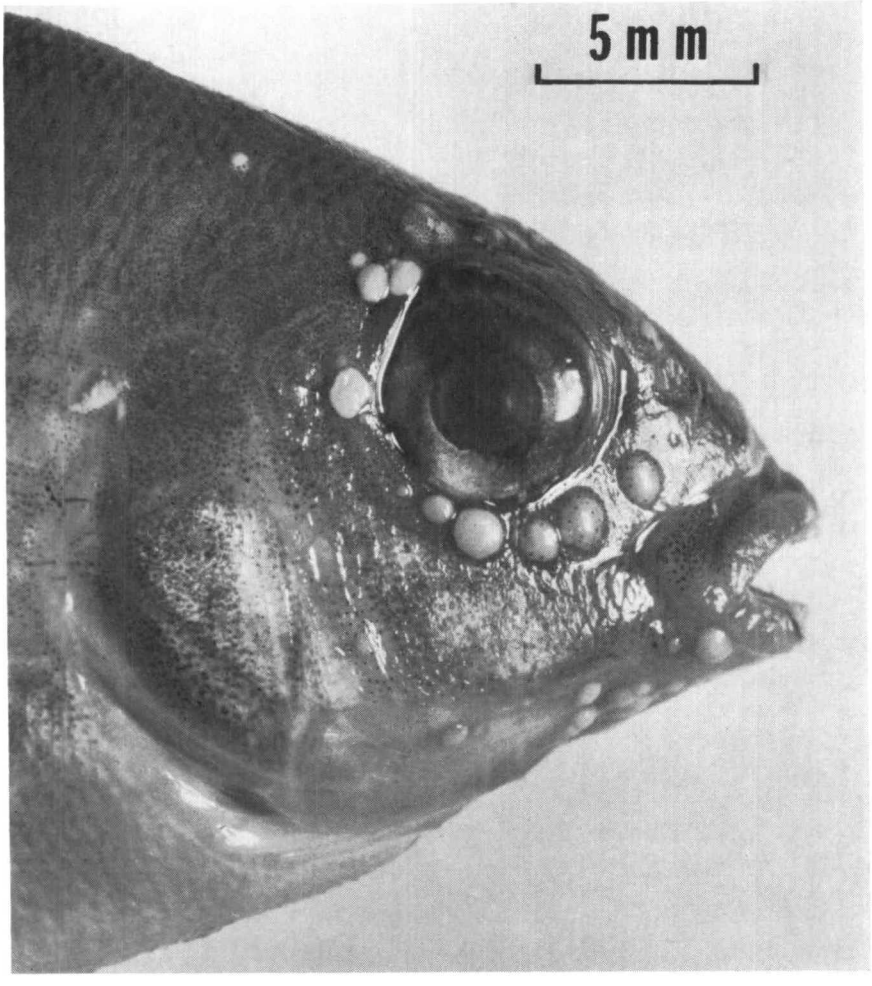

FIGURE 1. Cysts of *Henneguya lagodon* n. sp. on head of pinfish.

Location in the host.—The cysts of the parasite were found in the ocular and gular regions of the pinfish (Fig. 1). The cysts located close to the eyes were apparently larger than those farther away. The cysts were smaller and more numerous in the area between the eyes, with the greatest concentration occurring along a line between the center of the eyes. In the gular region the cysts were about the same size as those in the ocular region. In all areas the cysts were formed just under the skin.

On the pinfish of fork length 63.0 mm, a total of 65 cysts were found.

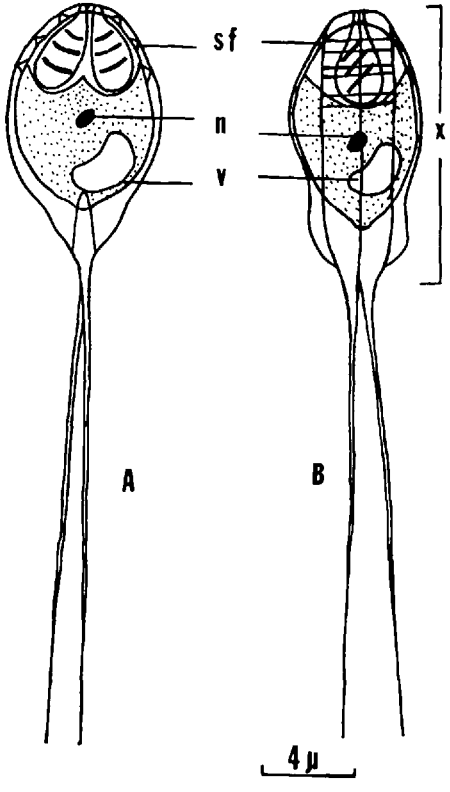

FIGURE 2. Front view (A) and side view (B) of Lugol-stained spores of *Henneguya lagodon* n. sp. s = sutural folds, n = nucleus, v = vacuole, x = x measurement (see text).

Of these, 25 were located around the eyes, 24 between the eyes, and 16 in the gular region. On the other specimen the cysts were not counted, but in addition to cysts around the head one was found in the eye.

Diagnosis.—The cysts were filled with a milky fluid containing a suspension of mature and developing spores. The cysts were obvious to the unaided eye and appeared whitish to yellowish in color. They were usually spherical or ellipsoidal in shape, although some cysts were irregularly shaped. The diameter of the cysts varied from 0.2 mm to 1.4 mm in width (mean 0.70 mm).

Few early stages in the development of the parasite were found. After staining with Giemsa's, one sporont was located which appeared as a pinkish-purple mass of protoplasm with twelve deep purple nuclei and two lighter nuclei, suggesting that the parasite is disporous.

The spores were elliptical in front view, biconvex and compressed parallel to the sutural plane; they possessed prolonged projections of equal length from each shell valve. An iodinophilous vacuole such as those typically found in this genus was observed in the sporoplasm after staining with a one-to-one mixture of Lugol's and distilled water. The vacuole appeared as a kidney-shaped orange body 2 μ by 3 μ. In some spores after staining with Giemsa's, a nucleus was seen in the sporoplasm. A sutural ridge 3.5 μ in width was observed, and in some cases, a straight sutural line was seen. Each spore contained two pyriform polar capsules of equal size. After staining spores with Lugol's solution, a polar filament with three windings could be seen in each polar capsule.

The sporoplasm almost filled the extra-capsular cavity, which projected slightly into the caudal end of the spore but did not extend into the area between the polar capsules. A thickening of the spore's valves was observed near the caudal end, perpendicular to the sutural ridge in the midfield of the shell and running up one-third the length of the shell. Six folds were found in the sutural ridge on the upper half of the spore.

The dimensions of the spores based on twenty measurements were: total length, 25.7-39.3 μ (mean 31.3 μ); body length, 7.1-10.0 μ (mean 8.4 μ); breadth, 5.7-7.1 μ (mean 6.4 μ); x-distance (Fig. 2) from tip of the polar capsule end of the spore to the inside shell just forward of the caudal projection, 10.0-11.4 μ (mean 10.7 μ); thickness, 4.6-6.8 μ (mean 5.7 μ); tail length, 17.1-3.0 μ (mean 23.8 μ); polar capsule length, 2.2-4.3 (mean 3.5 μ); and polar capsule breadth, 1.8-2.5 μ (mean 2.1 μ).

Several atypical spores were found in which the tail section of the valve was very large. Some spores had sharply curved tails, and one spore was observed with a tail 60 μ in length. Other spores, instead of having the usual ellipsoidal bodies, were shaped like a triangle, some with the vertex at the anterior end and others with it at the caudal end.

Comparisons.—Published descriptions of other species seen by the present authors make it appear that this pinfish parasite is different from similar species in the shape and dimensions of the spores.

Of the species described, five are similar but not identical to *Henneguya lagodon*. One species, *H. schizura* (Gurley, 1893) Labbe, has been found to infect the cellular tissues of the eye muscle. This parasite as described by Kudo (1920) was found in *Esox lucius*, a freshwater fish. Its spore dimensions are considerably different: it is longer (12 μ compared to 8.4), thinner (3 μ compared to 5.7), and has longer tails (36-48 μ compared to 23.8). Three other species, *H. neapolitana* (Parisi, 1912, as listed in Kudo, 1920), *H. tegidiensis* (Nicholas & Jones, 1959), and *H. latesi* (Tripathi, 1953) resemble *H. lagodon* in size, but differ from it in other ways. *H. latesi* and *H. tegidiensis* both parasitize freshwater species; *H. latesi* does

not possess any of the folds found on *H. lagodon*; *H. tegidiensis* is described as having unequal tails, while *H. lagodon* possesses equal tails. Though *H. neapolitana* is found in salt water, it infects the renal tubule of the kidney in the *Box salpa*. Furthermore, it does not possess the folds characteristic of *H. lagodon* and varies from it in some of its dimensions, the more outstanding ones being the tail, 40-50 μ compared to 23.8 μ in *H. lagodon*, the thickness, 8 μ compared to 5.7 μ, and the polar capsules, 4.7-5.5 μ by 3 μ compared to 3.5 μ by 2.1 μ.

Another species, *H. miyazakii* (Hoshina, 1952), is similar to *H. lagodon* in that it possesses the same sutural folds and thickening of the capsules at the caudal end. The spore, however, is larger in all dimensions than that of *H. lagodon* and possesses tails which meet at a large oblique angle, while the tails of *H. lagodon* meet at a small acute angle.

These differences between the *Henneguya* we found in pinfishes and other known species in this genus seem sufficient to give this parasite specific status. The specific name *Henneguya lagodon* is proposed.

Remarks.—Apparently infections of pinfish with *H. lagodon* are uncommon in Florida. In samples collected over two years, numbering 5,815 pinfish ranging from 15 to 225 mm in length, only two obviously infected fish were found. Fish dealers handling pinfish on Florida's upper west coast were asked by U. S. Fish and Wildlife Service agents if they had observed infected pinfish; they stated that they were unaware of this disease. A thorough search was not made for this parasite during our work, but the indication is that incidence and intensity of infection are both probably low. Caldwell (1957) also comments on the paucity of externally parasitized pinfish observed during his study despite "cursory examination of thousands of specimens." The pinfish he found with external parasites were generally small fish.

SUMARIO

Henneguya lagodon, UNA NUEVA ESPECIE DE PARÁSITO MYXOSPORIDIO DEL AGUJÓN, *Lagodon rhomboides*

Este parásito fué descubierto en agujones cogidos en aguas salinas del sur de la Florida. Se encontraron pocos agujones infectados con este parásito y hay cierta indicación de que los agujones de mayor talla puedan estar libres de esta enfermedad.

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